

# SEQUENCE LISTING

<110> Choe, Sunghwa  
Feldmann, Kenneth A

<120> Dwf7 MUTANTS

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<140> 09/775,879

<141> 2001-02-02

<150> 60/179,901

<151> 2000-02-02

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<170> PatentIn Ver. 2.0

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<220>

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25

<210> 2

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<213> Artificial Sequence

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ggaaagatca tcaaacattt acatgt

26

<210> 3

<211> 19

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<223> Description of Artificial Sequence: Primer S5D\_1F

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gcgcaatctt ctttcgttt

19

<210> 4

<211> 20

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<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer S5D\_1R

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tggacaacaa caacacaaga

20

<210> 5  
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<213> Artificial Sequence

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gatgcacaga gagcttcacg ac

22

<210> 6  
<211> 22  
<212> DNA  
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22

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<212> DNA  
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21

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<213> Artificial Sequence

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<223> Description of Artificial Sequence: Primer S5D\_4F

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catcttttgc cggcgaatct at

22

<210> 9

<211> 32  
<212> DNA  
<213> Artificial Sequence

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<212> DNA  
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aagtatagta gggttccggc gaggta 26

<210> 11  
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<213> Artificial Sequence

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atagattcgc cggcaaaaga tgactc 26

<210> 12  
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tgcaggatac catacagatac accacacgac at 32

<210> 13  
<211> 35  
<212> DNA  
<213> Artificial Sequence

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catacagatac accacacgac atacaagcat aacta 35

<210> 14  
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 <212> DNA  
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<220>  
 <223> Description of Artificial Sequence: Primer D7-3-3

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 atatggatgg attggatgtt tggctctc

28

<210> 15  
 <211> 364  
 <212> PRT  
 <213> delta-7 sterol C-5 desaturase (Candida glabrata)

<400> 15  
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 Tyr Ala Lys Ile Ala Pro Val Glu Leu Gln Arg Gly Ile Asp Asp Ser  
                   20                  25                  30  
 Leu Val Asn Ala Leu Ser Leu Asn Lys Ile Val Ser Asn Ser Thr Leu  
                   35                  40                  45  
 Leu His Glu Thr Leu Ser Ile Thr Asn Ser Leu Lys Arg Val Asn Lys  
                   50                  55                  60  
 Asp Val Tyr Gly Leu Thr Pro Phe Leu Phe Asp Phe Thr Glu Lys Thr  
                   65                  70                  75                  80  
 Tyr Ala Ser Leu Leu Pro Arg Asn Asn Leu Ile Arg Glu Phe Phe Ser  
                   85                  90                  95  
 Leu Trp Ala Val Val Thr Val Phe Gly Leu Leu Leu Tyr Leu Ile Thr  
                   100                  105                  110  
 Ala Ser Leu Ser Tyr Val Phe Val Phe Asp Arg Thr Ile Phe Asn His  
                   115                  120                  125  
 Pro Lys Tyr Leu Lys Asn Gln Met Tyr Leu Glu Ile Lys Leu Ala Val  
                   130                  135                  140  
 Ser Ala Ile Pro Thr Met Ser Leu Leu Thr Val Pro Trp Phe Met Leu  
                   145                  150                  155                  160  
 Glu Leu Asn Gly Tyr Ser Lys Leu Tyr Tyr Asp Val Asp Trp Glu His  
                   165                  170                  175  
 His Gly Leu Arg Lys Leu Leu Ile Glu Tyr Ala Thr Phe Ile Phe Phe  
                   180                  185                  190  
 Thr Asp Cys Gly Ile Tyr Leu Ala His Arg Trp Leu His Trp Pro Arg

195	200	205
Val Tyr Lys Ala Leu His Lys Pro His His Lys Trp Leu Val Cys Thr		
210	215	220
Pro Phe Ala Ser His Ala Phe His Pro Val Asp Gly Tyr Phe Gln Ser		
225	230	235 240
Leu Ser Tyr His Ile Tyr Pro Met Ile Leu Pro Leu His Lys Ile Ser		
	245	250 255
Tyr Leu Ile Leu Phe Thr Phe Val Asn Phe Trp Ser Val Met Ile His		
	260	265 270
Asp Gly Gln His Met Ser Asn Asn Pro Val Val Asn Gly Thr Ala Cys		
	275	280 285
His Thr Val His His Leu Tyr Phe Asn Tyr Asn Tyr Gly Gln Phe Thr		
	290	295 300
Thr Leu Trp Asp Arg Leu Gly Gly Ser Tyr Arg Arg Pro Glu Asp Ser		
	305	310 315 320
Leu Phe Asp Pro Lys Leu Lys Met Asp Lys Lys Val Leu Glu Lys Gln		
	325	330 335
Ala Arg Glu Thr Ala Ala Tyr Ile Gln Glu Val Glu Gly Asp Asp Thr		
	340	345 350
Asp Arg Val Tyr Asn Thr Asp Lys Lys Lys Thr Asn		
	355	360
<210> 16		
<211> 365		
<212> PRT		
<213> delta-7 sterol C-5 desaturase (Saccharomyces cerevisiae)		
<400> 16		
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1	5	10 15
Tyr Ala Lys Val Leu Pro Ala Ser Leu Ala Ala Asn Ile Pro Val Lys		
	20	25 30
Trp Gln Lys Leu Leu Gly Leu Asn Ser Gly Phe Ser Asn Ser Thr Ile		
	35	40 45
Leu Gln Glu Thr Leu Asn Ser Lys Asn Ala Val Lys Glu Cys Arg Arg		
	50	55 60
Phe Tyr Gly Gln Val Pro Phe Leu Phe Asp Met Ser Thr Thr Ser Phe		
	65	70 75 80

Ala Ser Leu Leu Pro Arg Ser Ser Ile Leu Arg Glu Phe Leu Ser Leu  
                             85                            90                            95

Trp Val Ile Val Thr Ile Phe Gly Leu Leu Tyr Leu Phe Thr Ala  
                             100                            105                            110

Ser Leu Ser Tyr Val Phe Val Phe Asp Lys Ser Ile Phe Asn His Pro  
                             115                            120                            125

Arg Tyr Leu Lys Asn Gln Met Ala Met Glu Ile Lys Leu Ala Val Ser  
                             130                            135                            140

Ala Ile Pro Trp Met Ser Met Leu Thr Val Pro Trp Phe Val Met Glu  
 145                            150                            155                            160

Leu Asn Gly His Ser Lys Leu Tyr Met Lys Ile Asp Tyr Glu Asn His  
                             165                            170                            175

Gly Val Arg Lys Leu Ile Ile Glu Tyr Phe Thr Phe Ile Phe Phe Thr  
                             180                            185                            190

Asp Cys Gly Val Tyr Leu Ala His Arg Trp Leu His Trp Pro Arg Val  
                             195                            200                            205

Tyr Arg Ala Leu His Lys Pro His His Lys Trp Leu Val Cys Thr Pro  
                             210                            215                            220

Phe Ala Ser His Ser Phe His Pro Val Asp Gly Phe Leu Gln Ser Ile  
 225                            230                            235                            240

Ser Tyr His Ile Tyr Pro Leu Ile Leu Pro Leu His Lys Val Ser Tyr  
                             245                            250                            255

Leu Ile Leu Phe Thr Phe Val Asn Phe Trp Thr Val Met Ile His Asp  
                             260                            265                            270

Gly Gln Tyr Leu Ser Asn Asn Pro Ala Val Asn Gly Thr Ala Cys His  
                             275                            280                            285

Thr Val His His Leu Tyr Phe Asn Tyr Asn Tyr Gly Gln Phe Thr Thr  
                             290                            295                            300

Leu Trp Asp Arg Leu Gly Gly Ser Tyr Arg Arg Pro Asp Asp Ser Leu  
 305                            310                            315                            320

Phe Asp Pro Lys Leu Arg Asp Ala Lys Glu Thr Trp Asp Ala Gln Val  
                             325                            330                            335

Lys Glu Val Glu His Phe Ile Lys Glu Val Glu Gly Asp Asp Asn Asp  
                             340                            345                            350

Arg Ile Tyr Glu Asn Asp Pro Asn Thr Lys Lys Asn Asn  
                             355                            360                            365

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 <212> PRT  
 <213> delta-7 sterol C-5 desaturase (Schizosaccharomyces pombe)

<400> 17  
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 Tyr Gly Lys Ile Ala Glu Ser Phe Asp Ser Ser Ser Ser Phe Ala Asn  
                   20                  25                  30  
 Thr Ala Val Asn Ser Thr Thr Leu Gly Leu Ala Glu Lys Val Asn Phe  
                   35                  40                  45  
 Ala Ile Thr Ser Gly Leu Leu Asp Arg Asn Asn Val Trp Arg Gln Phe  
                   50                  55                  60  
 Thr Ser Leu Phe Leu Ile Thr Trp Ile Met Gly Thr Leu Ser Tyr Phe  
                   65                  70                  75                  80  
 Leu Ser Ala Ser Phe Ala Tyr Tyr Val Tyr Phe Asp Arg Glu Glu Ala  
                           85                  90                  95  
 Arg Arg His Pro Lys Phe Leu Lys Asn Gln Glu His Leu Glu Leu Met  
                   100                  105                  110  
 Val Ala Leu Lys Asn Leu Pro Gly Met Ala Ile Leu Thr Ala Pro Trp  
                   115                  120                  125  
 Phe Leu Ala Glu Ile Arg Gly Tyr Gly Tyr Val Tyr Asp Lys Leu Asp  
                   130                  135                  140  
 Glu Tyr Gly Tyr Phe Tyr Leu Phe Phe Ser Ile Ala Leu Phe Leu Leu  
                   145                  150                  155                  160  
 Phe Ser Asp Phe Leu Ile Tyr Trp Ile His Arg Ala Leu His His Arg  
                   165                  170                  175  
 Trp Leu Tyr Ala Pro Leu His Lys Leu His His Lys Trp Ile Val Pro  
                   180                  185                  190  
 Thr Pro Tyr Ser Ser His Ala Phe His Tyr Leu Asp Gly Tyr Ser Gln  
                   195                  200                  205  
 Ser Leu Pro Tyr His Met Phe Pro Phe Phe Phe Pro Leu Asn Lys Tyr  
                   210                  215                  220  
 Val Tyr Leu Leu Leu Phe Gly Ser Val Asn Tyr Trp Thr Val Leu Ile  
                   225                  230                  235                  240  
 His Asp Gly Lys Tyr Phe Ser Asn Asn Ala Val Val Asn Gly Ala Ala  
                   245                  250                  255

His His Ala Ala His His Met Tyr Phe Asn Tyr Asn Tyr Gly Gln Phe  
 260 265 270

Phe Thr Leu Phe Asp Arg Leu Cys Ser Ser Tyr Arg Gln Pro Asp Gln  
 275 280 285

Glu Leu Phe Asp Ala Glu Leu Arg Asn Glu Lys Leu Gln Glu Gln Arg  
 290 295 300

Ile Arg Phe Met Glu Thr Val Gln Tyr Thr Val Glu Gly Lys Asp Asp  
 305 310 315 320

Arg Thr Tyr Ala Ser Lys Lys Asp Asn  
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<210> 18

<211> 281

<212> PRT

<213> DWF7/STE1 (Arabidopsis)

<400> 18

Met Ala Ala Asp Asn Ala Tyr Leu Met Gln Phe Val Asp Glu Thr Ser  
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Phe Tyr Asn Arg Ile Val Leu Ser His Leu Leu Pro Ala Asn Leu Trp  
 20 25 30

Glu Pro Leu Pro His Phe Leu Gln Thr Trp Leu Arg Asn Tyr Leu Ala  
 35 40 45

Gly Thr Leu Leu Tyr Phe Ile Ser Gly Phe Leu Trp Cys Phe Tyr Ile  
 50 55 60

Tyr Tyr Leu Lys Ile Asn Val Tyr Leu Pro Lys Asp Ala Ile Pro Thr  
 65 70 75 80

Ile Lys Ala Met Arg Leu Gln Met Phe Val Ala Met Lys Ala Met Pro  
 85 90 95

Trp Tyr Thr Leu Leu Pro Thr Val Ser Glu Ser Met Ile Glu Arg Gly  
 100 105 110

Trp Thr Lys Cys Phe Ala Ser Ile Asp Glu Phe Gly Trp Ile Leu Tyr  
 115 120 125

Phe Val Tyr Ile Ala Ile Tyr Leu Val Phe Val Glu Phe Gly Ile Tyr  
 130 135 140

Trp Met His Arg Glu Leu His Asp Ile Lys Pro Leu Tyr Lys Tyr Leu  
 145 150 155 160

His Ala Thr His His Ile Tyr Asn Lys Gln Asn Thr Leu Ser Pro Phe  
 165 170 175



Ala Gly Leu Ala Phe His Pro Val Asp Gly Ile Leu Gln Ala Val Pro  
180 185 190

His Val Ile Ala Leu Phe Ile Val Pro Ile His Phe Thr Thr His Ile  
195 200 205

Gly Leu Leu Phe Met Glu Ala Ile Trp Thr Ala Asn Ile His Asp Cys  
210 215 220

Ile His Gly Asn Ile Trp Pro Val Met Gly Ala Gly Tyr His Thr Ile  
225 230 235 240

His His Thr Thr Tyr Lys His Asn Tyr Gly His Tyr Thr Ile Trp Met  
245 250 255

Asp Trp Met Phe Gly Ser Leu Arg Asp Pro Leu Leu Glu Glu Asp Asp  
260 265 270

Asn Lys Asp Ser Phe Lys Lys Ala Glu  
275 280

<210> 19  
<211> 291  
<212> PRT  
<213> delta-7 sterol C-5 desaturase concensus

<400> 19  
Met Asp Leu Val Leu Glu Ala Asp His Tyr Val Phe Asp Asp Tyr Ala  
1 5 10 15

Lys Ile Pro Leu Ala Ile Asp Ser Leu Leu Asn Val Ser Asn Ser Thr  
20 25 30

Leu Glu Thr Leu Asn Lys Val Asn Tyr Gly Pro Phe Leu Phe Asp Phe  
35 40 45

Thr Glu Thr Ser Phe Ser Leu Leu Pro Arg Asn Asn Leu Trp Arg Glu  
50 55 60

Phe Leu Ser Leu Trp Leu Ile Val Thr Ile Phe Gly Leu Leu Tyr Ile  
65 70 75 80

Ala Ser Leu Ser Tyr Phe Phe Asp Ile Phe Asn His Pro Lys Tyr Leu  
85 90 95

Lys Asn Gln Met Leu Glu Ile Lys Ala Val Ala Ile Pro Trp Met Ser  
100 105 110

Leu Leu Thr Val Pro Trp Phe Met Glu Leu Gly Tyr Ser Lys Leu Tyr  
115 120 125

Lys Ile Asp Glu His Gly Arg Lys Leu Phe Ile Glu Ala Thr Phe Phe  
130 135 140

Phe Thr Asp Gly Ile Tyr Ala His Arg Trp Leu His Trp Pro Tyr Lys  
 145 150 155 160  
 Ala Leu His Lys Pro His His Lys Trp Leu Val Cys Thr Pro Phe Ala  
 165 170 175  
 Ser His Ala Phe His Pro Val Asp Gly Tyr Leu Gln Ser Leu Tyr His  
 180 185 190  
 Ile Tyr Pro Leu Leu Pro Leu His Lys Ser Tyr Leu Leu Phe Thr Phe  
 195 200 205  
 Val Asn Phe Trp Thr Val Met Ile His Asp Gly Gln Ser Asn Asn Pro  
 210 215 220  
 Val Val Asn Gly Ala Cys His Thr Val His His Leu Tyr Phe Asn Tyr  
 225 230 235 240  
 Asn Tyr Gly Gln Phe Thr Thr Leu Trp Asp Arg Leu Gly Gly Ser Tyr  
 245 250 255  
 Arg Arg Pro Asp Ser Leu Phe Asp Pro Lys Leu Arg Asp Lys Lys Glu  
 260 265 270  
 Gln Arg Glu Thr Tyr Ile Glu Val Glu Gly Asp Asp Asp Arg Tyr Asp  
 275 280 285  
 Lys Lys Asn  
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<210> 20  
 <211> 1889  
 <212> DNA  
 <213> Genomic dwf7 (Arabidopsis)

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 gtggatagtt catgtttgca tttattgatt atttgtgcat attctccatc taagggattg 540  
 aacagttagt ggcttatata agtttttgtg caaccaatga gaagtcgtac atctttgaag 600  
 ttgaattttc tacttgccat ttaagtccac ttaaattggt tggatgaagt attgtctact 660  
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<210> 21  
 <211> 281  
 <212> PRT  
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<400> 21

Met Ala Ala Asp Asn Ala Tyr Leu Met Gln Phe Val Asp Glu Thr Ser  
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Phe Tyr Asn Arg Ile Val Leu Ser His Leu Leu Pro Ala Asn Leu Trp  
 20 25 30

Glu Pro Leu Pro His Phe Leu Gln Thr Trp Leu Arg Asn Tyr Leu Ala  
 35 40 45

Gly Thr Leu Leu Tyr Phe Ile Ser Gly Phe Leu Trp Cys Phe Tyr Ile  
 50 55 60

Tyr Tyr Leu Lys Ile Asn Val Tyr Leu Pro Lys Asp Ala Ile Pro Thr  
 65 70 75 80

Ile Lys Ala Met Arg Leu Gln Met Phe Val Ala Met Lys Ala Met Pro  
 85 90 95

Trp Tyr Thr Leu Leu Pro Thr Val Ser Glu Ser Met Ile Glu Arg Gly  
 100 105 110

Trp Thr Lys Cys Phe Ala Ser Ile Asp Glu Phe Gly Trp Ile Leu Tyr  
 115 120 125

Phe Val Tyr Ile Ala Ile Tyr Leu Val Phe Val Glu Phe Gly Ile Tyr  
 130 135 140

Trp Met His Arg Glu Leu His Asp Ile Lys Pro Leu Tyr Lys Tyr Leu  
 145 150 155 160

His Ala Thr His His Ile Tyr Asn Lys Gln Asn Thr Leu Ser Pro Phe  
 165 170 175

Ala Gly Leu Ala Phe His Pro Val Asp Gly Ile Leu Gln Ala Val Pro  
180 185 190

His Val Ile Ala Leu Phe Ile Val Pro Ile His Phe Thr Thr His Ile  
195 200 205

Gly Leu Leu Phe Met Glu Ala Ile Trp Thr Ala Asn Ile His Asp Cys  
210 215 220

Ile His Gly Asn Ile Trp Pro Val Met Gly Ala Gly Tyr His Thr Ile  
225 230 235 240

His His Thr Thr Tyr Lys His Asn Tyr Gly His Tyr Thr Ile Trp Met  
245 250 255

Asp Trp Met Phe Gly Ser Leu Arg Asp Pro Leu Leu Glu Glu Asp Asp  
260 265 270

Asn Lys Asp Ser Phe Lys Lys Ala Glu  
275 280

<210> 22  
<211> 2925  
<212> DNA  
<213> Genomic HDF7

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Trp Glu Pro Leu Pro His Phe Leu Gln Thr Trp Leu Arg Asn Tyr Leu
      35              40              45

Ala Gly Asn Ile Leu Tyr Phe Ile Ser Gly Phe Leu Trp Cys Phe Tyr
      50              55              60

Ile Tyr Tyr Leu Lys Leu Asn Val Tyr Val Pro Lys Glu Ser Ile Pro
      65              70              75              80

Thr Arg Lys Ala Met Leu Leu Gln Ile Tyr Val Ala Met Lys Ala Met
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Pro Trp Tyr Thr Leu Leu Pro Ala Val Ser Glu Tyr Met Ile Glu His
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Gly Trp Thr Lys Cys Tyr Ser Thr Leu Asp His Phe Asn Trp Phe Leu
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Tyr Trp Val His Lys Glu Leu His Asp Ile Lys Phe Leu Tyr Lys His  
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Leu His Ala Thr His His Met Tyr Asn Lys Gln Asn Thr Leu Ser Pro  
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Phe Ala Gly Leu Ala Phe His Pro Leu Asp Gly Ile Leu Gln Ala Ile  
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Pro His Val Ile Ala Leu Phe Ile Val Pro Ile His Leu Ile Thr His  
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Leu Ser Leu Leu Phe Leu Glu Gly Ile Trp Thr Ala Ser Ile His Asp  
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Cys Ile His Gly Asn Ile Trp Pro Ile Met Gly Ala Gly Tyr His Thr  
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Ile His His Thr Thr Tyr Lys His Asn Tyr Gly His Tyr Thr Ile Trp  
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Glu Pro Leu Pro His Phe Leu Gln Thr Trp Leu Arg Asn Tyr Leu Ala  
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Gly Thr Leu Leu Tyr Phe Ile Ser Gly Phe Leu Trp Cys Phe Tyr Ile  
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Tyr Tyr Leu Lys Ile Asn Val Tyr Leu Pro Lys Asp Ala Ile Pro Thr  
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Ile Lys Ala Met Arg Leu Gln Met Phe Val Ala Met Lys Ala Met Pro  
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Trp Tyr Thr Leu Leu Pro Thr Val Ser Glu Ser Met Ile Glu Arg Gly  
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Trp Thr Lys Cys Phe Ala Ser Ile Asp Glu Phe Gly Trp Ile Leu Tyr  
115 120 125

Phe Val Tyr Ile Ala Ile Tyr Leu Val Phe Val Glu Phe Gly Ile Tyr  
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Trp Met His Arg Glu Leu His Asp Ile Lys Pro Leu Tyr Lys Tyr Leu  
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His Ala Thr His His Ile Tyr Asn Lys Gln Asn Thr Leu Ser Pro Phe  
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Ala Gly Leu Ala Phe His Pro Val Asp Gly Ile Leu Gln Ala Val Pro  
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His Val Ile Ala Leu Phe Ile Val Pro Ile His Phe Thr Thr His Ile  
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Gly Leu Leu Phe Met Glu Ala Ile Trp Thr Ala Asn Ile His Asp Cys  
210 215 220

Ile His Gly Asn Ile Trp  
225 230